

KAIST IP US LLC

V.

Samsung Electronics Co., LTD., et al.

Samsung Defendants' Motions For JMOL On Damages And New Trial

July 25, 2019

The Verdict

QUESTION #1:

Did KAIST prove by a preponderance of the evidence that any Defendant named below infringed **ANY** of the Asserted Claims?

Answer “Yes” or “No” for each Defendant listed below:

The Samsung Defendants

Yes

The GlobalFoundries Defendants

Yes

Qualcomm

Yes

The Verdict

QUESTION #4:

What sum of money, if any, if paid now in cash, do you find by a preponderance of the evidence would fairly and reasonably compensate KAIST for any infringement by a Defendant whom you have found to be infringing? Only award damages for those Asserted Claims that you have found to be both infringed by a Defendant and not invalid as to each Defendant listed below.

Answer in Dollars and Cents, if any:

The Samsung Defendants \$ 400,000,000

As to the sum(s) you have awarded against the Samsung Defendants, if any, indicate below if that amount is intended to represent:

✓ A Lump Sum OR _____ A Running Royalty

The Verdict

The GlobalFoundries Defendants \$ 0

As to the sum(s) you have awarded against the GlobalFoundries Defendants, if any, indicate below if that amount is intended to represent:

 A Lump Sum OR A Running Royalty

Qualcomm \$ 0

As to the sum(s) you have awarded against Qualcomm, if any, indicate below if that amount is intended to represent:

 A Lump Sum OR A Running Royalty

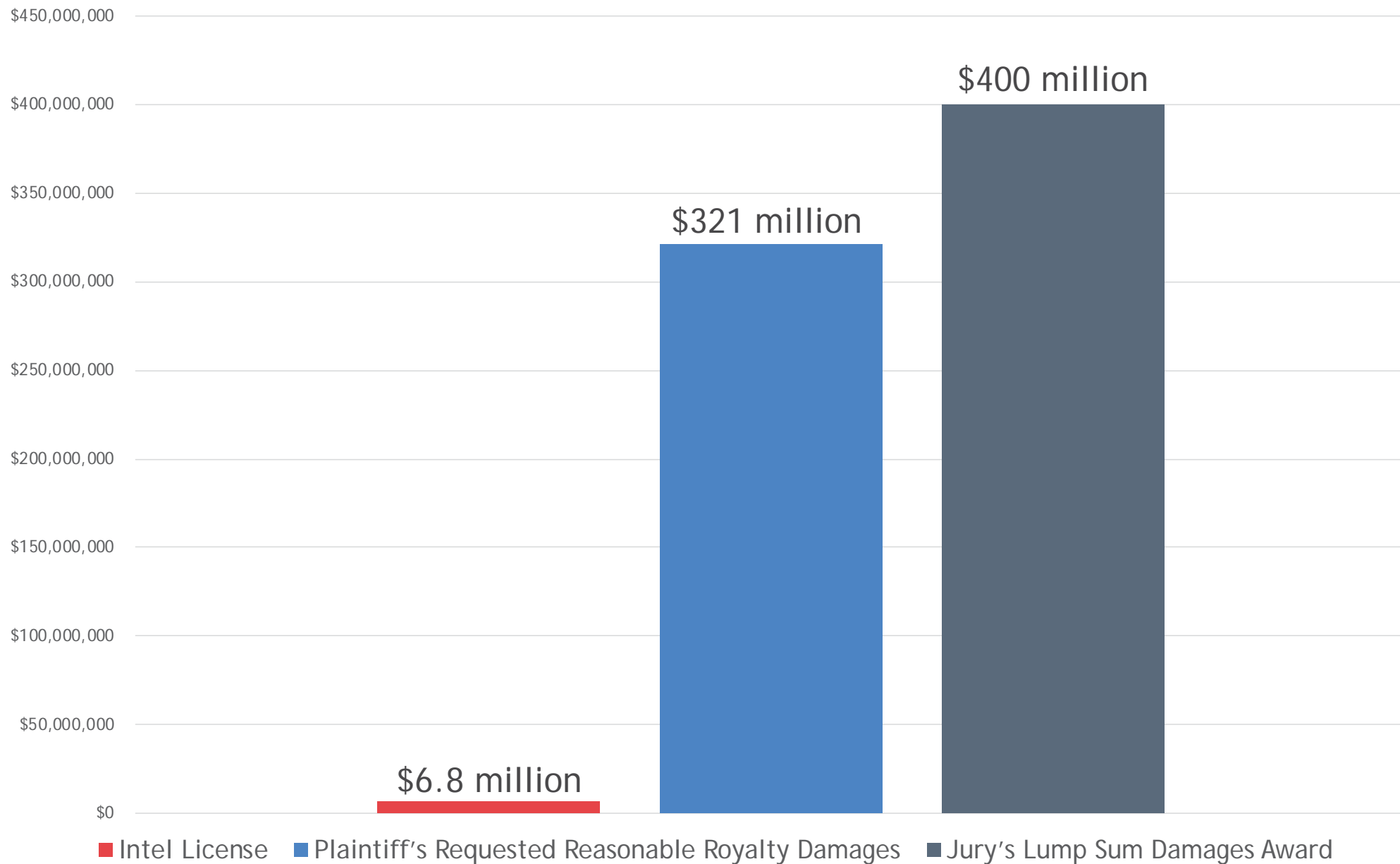
The \$400M Damages Award Exceeded Plaintiff's Request

Plaintiff requested damages of only:

- \$321,438,451 against Samsung
- \$296,851,609 against Qualcomm
- \$98,541,744 against GlobalFoundries

Plaintiff's expert Roy Weinstein testified that these amounts were "adequate to compensate for infringement."

Damages Are 60x The Intel License



The Evidence Is Legally Insufficient To Support The Damages Award

1. Running royalty evidence cannot support the lump sum verdict.
2. The damages are 60x the comparable Intel license.
3. The damages were not apportioned to the incremental value of the patent.
4. The damages were not apportioned to the smallest saleable unit.
5. Plaintiff arbitrarily assumed a 12% profit share.
6. Plaintiff's damages model improperly relied on perfect future knowledge of sales and profits.
7. Plaintiff's analysis rested on an unreliable regression model.
8. Plaintiff double-counted damages for products with Snapdragon chips.

Ground 1:

Running royalty evidence cannot support the jury's lump sum damages award

Plaintiff's Running Royalty Evidence Cannot Support The Lump Sum Verdict



"[C]ertain fundamental differences exist between lump-sum agreements and running-royalty agreements."

"Compared to a running royalty analysis, a lump-sum analysis involves different considerations."

"For a jury to use a running-royalty agreement as a basis to award lump-sum damages, ... some basis for comparison must exist in the evidence presented to the jury. "

Lucent Technologies, Inc. v. Gateway, Inc., 580 F.3d 1301, 1326, 1330 (Fed. Cir. 2009)

Plaintiff's Running Royalty Evidence Cannot Support The Lump Sum Verdict




"In this case, [the expert] cited to the two lump sum payments, ... but he did not offer any testimony to explain how those payments could be converted to a royalty rate. ... [T]he lump-sum agreements are not substantial evidence in support of the jury's verdict."

Whitserve, LLC v. Computer Packages, Inc., 694 F.3d 10, 30 (Fed. Cir. 2012)

Plaintiff's Running Royalty Evidence Cannot Support The Lump Sum Verdict

Plaintiff's expert Mr. Weinstein based damages on profit per unit sold:

Speed and Power Efficiency Damages - Summary		
 <div>November 29, 2016 – May 14, 2018</div>		
Accused Product Unit Sales	Speed and Power Efficiency Damages Rate	Damages
Smartphones 8,315,112	\$4.74 per unit	\$39,413,631
Tablets 1,632,820	\$3.74 per unit	\$6,106,747
Exynos SoCs 245,656,852	\$0.71 per unit	\$174,416,365
Total Damages		\$219,936,743

Supplemental Report, Exhibits 20.1S, 20.2S, 20.3S, 20.4S, and 20.5S. PDX

Plaintiff's Running Royalty Evidence Cannot Support The Lump Sum Verdict

Mr. Weinstein thus performed solely a running royalty analysis.

Mr. Weinstein did not perform a lump sum analysis.

Mr. Weinstein proposed no alternative lump sum figures.

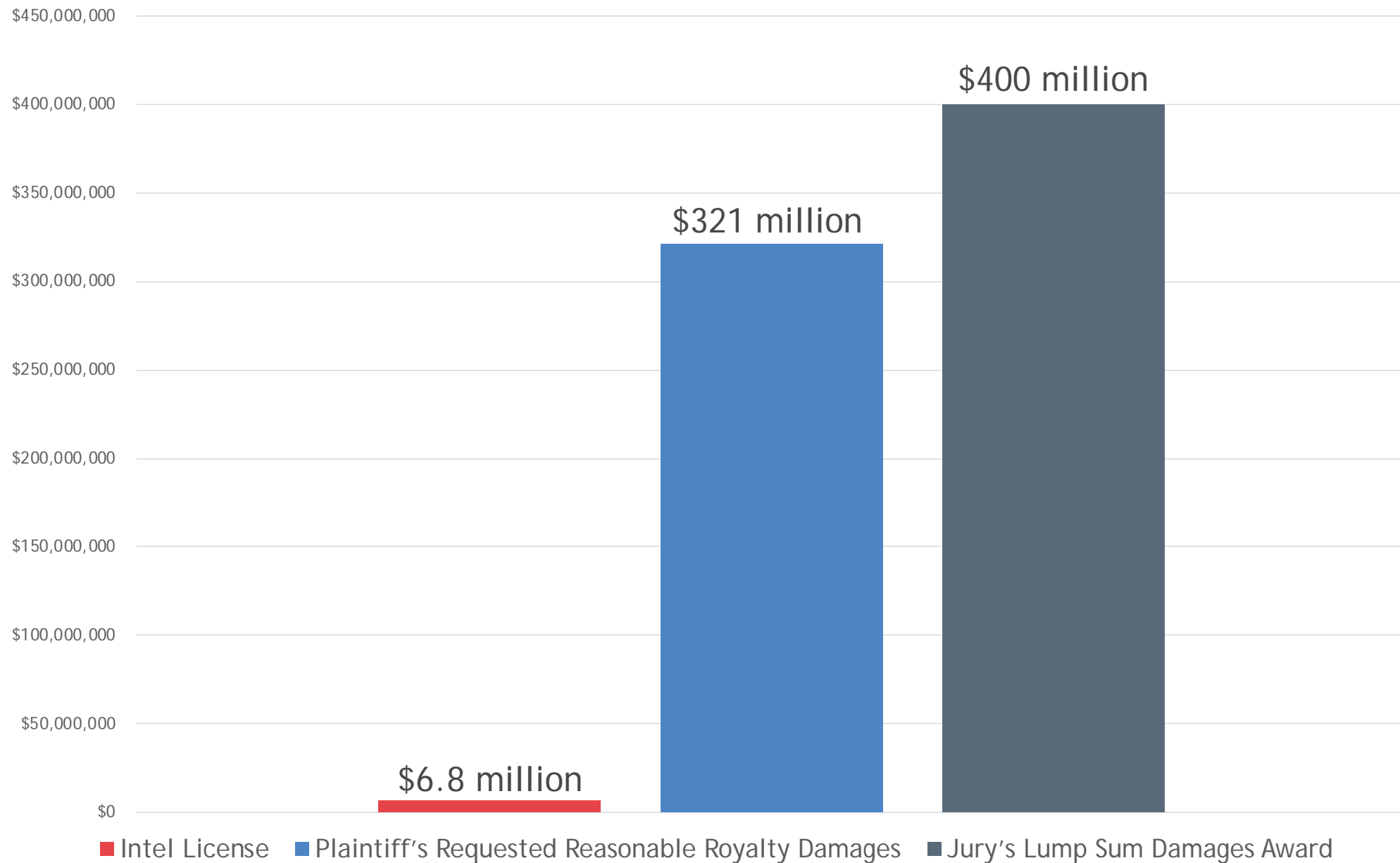
Mr. Weinstein presented no basis to convert the running royalty into a lump sum.

- Did not discount future royalty payments to present value
- Did not factor in uncertainty of future sales

Ground 2:

The damages are 60x the comparable Intel license

The Damages Are 60x The Comparable Intel License



Comparable Licenses Are Highly Probative



"Actual licenses to the patented technology are highly probative as to what constitutes a reasonable royalty for those patent rights because such actual licenses most clearly reflect the economic value of the patented technology in the marketplace."

LaserDynamics, Inc. v. Quanta Computer, Inc. 694 F.3d 51, 79 (Fed. Cir. 2012)



"[W]here the award was a multiple of the average license amounts presented, here, there is 'little evidentiary basis under *Georgia-Pacific* Factor 2 for awarding roughly three to four times the average amount in the lump-sum agreements in evidence.' "

Whitserve, LLC v. Comput. Packages, Inc., 694 F.3d 10, 30-31 (Fed. Cir. 2012)

The Intel License Was Highly Comparable

- Licensed the same '055 Patent
- License negotiated outside of litigation
- Non-exclusive license
- Intel an even larger player than Samsung
- License for a longer period (over 11 years)
- License covered more products (all nodes, not just 14 nm)

The Intel License Was Highly Comparable

It is undisputed that Intel, at the time of its license, was already committed to bulk FinFET.

Roy Weinstein

Q. ... [A]t the time of the Intel agreement between P&IB, Professor Lee, and Intel, all those parties knew with certainty that Intel had already launched its [bulk] FinFET products?

A. I believe so, yes.

Defendants' Expert Stephen Becker

A. At the time that Intel sat down, they had already announced their next generation of FinFET chips. So in a sense there's no going back for Intel...

Q. What about manufacturing facilities?

A. ... [W]hen they signed the license, they had already built or at least converted a number of their manufacturing facilities to use the FinFET -- bulk FinFET.

Plaintiff Did Not Account For The Comparable Intel License

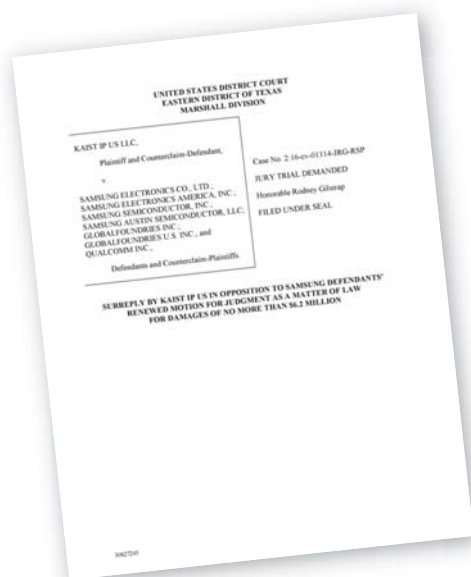
Mr. Weinstein recognized that the Intel license is “the only actual real-world license to the ‘055 Patent.”

- But Mr. Weinstein did not actually consider the amount of the Intel license in his Georgia Pacific analysis.
- And Mr. Weinstein gave no explanation of why his damages opinion was 60x the license.

Plaintiff Did Not Account For The Comparable Intel License

Plaintiff

“Mr. Weinstein testified that the Intel License was a downward predicate on his analysis.” (citing 6/12/18 pm at 193:9-201:12, 201:14-202:14).



Wrong:

Mr. Weinstein mentioned other downward predicates (at 200:2-16):

- Geographic scope
- Parties not competitors

Did not mention \$6.8M amount of Intel license as a downward predicate.

Ground 3:

Damages were not apportioned to the value of the patent

Damages Were Not Tied To The Incremental Value Of The Patent

Kelin Kuhn



Dr. Kuhn attributed all of the benefit of bulk FinFET to the '055 Patent, despite admitting '055 Patent did not invent bulk FinFET:

Q. ... Now, all those benefits that you just summarized, you're attributing solely to the '055 patent, aren't you?

A. I'm attributing to the transistor design in the '055 patent, that's correct.

Q. [T]here's no question, is there, that Professor Lee didn't invent the concept of tying a Fin to the bulk substrate; isn't that right?

A. That's fair, sir.

Q. Okay. So to say that in a short version, Professor Lee didn't invent the bulk FinFET generally; isn't that correct?

A. Yes, sir.

Damages Were Not Tied To The Value Of The Patent



"[T]he trial court must carefully tie proof of damages to the claimed invention's footprint in the market place."

ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010)



"It is not enough to merely show that the [patented feature] is viewed as valuable ... or even essential to the use of the [product].'"

VirnetX, Inc. v. Cisco Systems, Inc., 767 F.3d 1308, 1326-27 (Fed. Cir. 2014)



"[W]hen the product contains multiple valuable features, it is not enough to merely show that the patented feature is viewed as essential, that a product would not be commercially viable without the patented feature, or that consumers would not purchase the product without the patented feature."

Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., 904 F.3d 965, 979 (Fed. Cir. 2018)

Damages Were Not Tied To The Incremental Value Of The Patent Over The Prior Art



The damages inquiry concerns “the added usefulness of an innovation over the prior art,” and “the royalty ... should reflect the approximate value of that technological contribution.”

Ericsson, Inc. v. D-Link Systems, Inc., 773 F.3d 1201, 1233 (Fed. Cir. 2014)

Damages Were Not Tied To The Incremental Value Of The Patent Over The Prior Art

- The prosecution history of the '055 Patent shows that the patent was initially rejected as anticipated by Inaba.
- The patent was granted only because it added certain numerical constraints on the thickness of the gate oxide and first oxide layers.
- Plaintiff's experts made no attempt to separate out the incremental benefit of the thickness constraints that were the sole basis for granting the patent despite Inaba.

Case 2:16-cv-01314-JRG Document 664-2 Filed 07/25/19 Page 25 of 64 PageID #: 36991

Damages Were Not Tied To The Incremental Value Of The Patent Over The Prior Art

Roy Weinstein



Mr. Weinstein's damages calculation depended on the attribution opinions of Kelin Kuhn and David Witt

Q. Would you agree if Dr. Kuhn is incorrect that the incremental benefits of the accused 14-nanometer FinFETs are solely attributable to the '055 patent, that your damages opinion is overstated?

A. I would agree that if her opinion is incorrect, my damages results would also be incorrect.

* * * * *

Q. And similarly, if Mr. Witt has overstated the percentage improvements that he testified about, would you agree that your damages are overstated?

A. I would.

Case 2:16-cv-01314-JRG Document 664-2 Filed 07/25/19 Page 26 of 64 PageID #: 36992

Damages Were Not Tied To The Incremental Value Of The Patent Over The Prior Art

Kelin Kuhn



David Witt



But Dr. Kuhn and Mr. Witt assumed no benefit from prior art

Q. Your analysis didn't include the incremental advance of the '055 Patent over, for example, Inaba in your benefits analysis, did it?

A. No, sir.

Q. Your benefits analysis didn't apportion for the incremental advance of the '055 Patent over Mizuno, did it?

A. No, sir.

Q. Is it also correct that you didn't do any analysis to determine what the advance of the '055 patent is over the prior art?

A. That is true.

Trial Testimony on 6/12/18 pm at 88:8-15; 42:22-43:4

Trial Testimony on 6/12/18 pm at 151:12-15; 152:20-24; 161:7-9

Damages Did Not Factor Out Non-Infringing Features

Kelin Kuhn



Kuhn ignored the Hafnium layer, which was necessary to commercial viability

Q. [Y]ou didn't attribute the benefit of any High-k material in those devices, did you?

A. No, sir.

Q. Whatever benefit that High-k Hafnium oxide material provides, it's not provided by the '055 Patent. You agree with that?

A. Yes, sir.

* * * * *

Q. Right. And you need a High-k stack if you're getting down to 14 nanometers, don't you?

A. That's the general consensus, sir.

...

Q. Okay. [Without the Hafnium oxide, i]t couldn't be commercially viable, would it?

A. No, sir.

Damages Did Not Factor Out The Cost To Commercialize The Patent

Case 2:16-cv-01314-JRG Document 664-2 Filed 07/25/19 Page 28 of 64 PageID #: 36994

Kelin Kuhn



- Q. Did you attribute any of the perspiration in actually building that 14-nanometer FinFET, what went into that vis-a-vis the '055 Patent?
- A. It wasn't necessary in this case.

Dr. Kim



- Q. How much money did Samsung invest into research and development activities relating to its FinFET technology?
- A. If you're asking about the investment up until now, it's rather difficult for me, but if you're talking about as of 2012, what—which was when it—after the completion of our product definition, so that we can provide that to our first customers, we're talking about \$300 million.

Ground 4:

Damages were not tied to the smallest saleable unit

Damages Were Not Tied To The Smallest Saleable Unit



"[T]he patentee must estimate what portion of that smallest salable unit is attributable to the patented technology when the smallest salable unit itself contains several non-infringing features."

Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., 904 F.3d 965, 977 (Fed. Cir. 2018)

Damages Were Not Tied To The Smallest Saleable Unit


Mr. Weinstein calculated the benefit of the '055 Patent based on the retail prices of phones and tablets, not the prices of chips:

A. ... With respect to smartphones, what I found is that a 1 percent increase in speed leads to a \$1.06 increase in the retail price of smartphones, holding other things constant. With respect to tablets, a 1 percent increase in speed leads to a price increase of 92 cents

A. ... [T]he increased profit associated with a 1-percent increase in speed, [shows]... the total increase in profit ... with respect to the Galaxy phone is \$33.92.

Damages Were Not Tied To The Smallest Saleable Unit

Clearly not based on the smallest saleable unit given differences in supposed benefit for smartphones, tablets, and chips.

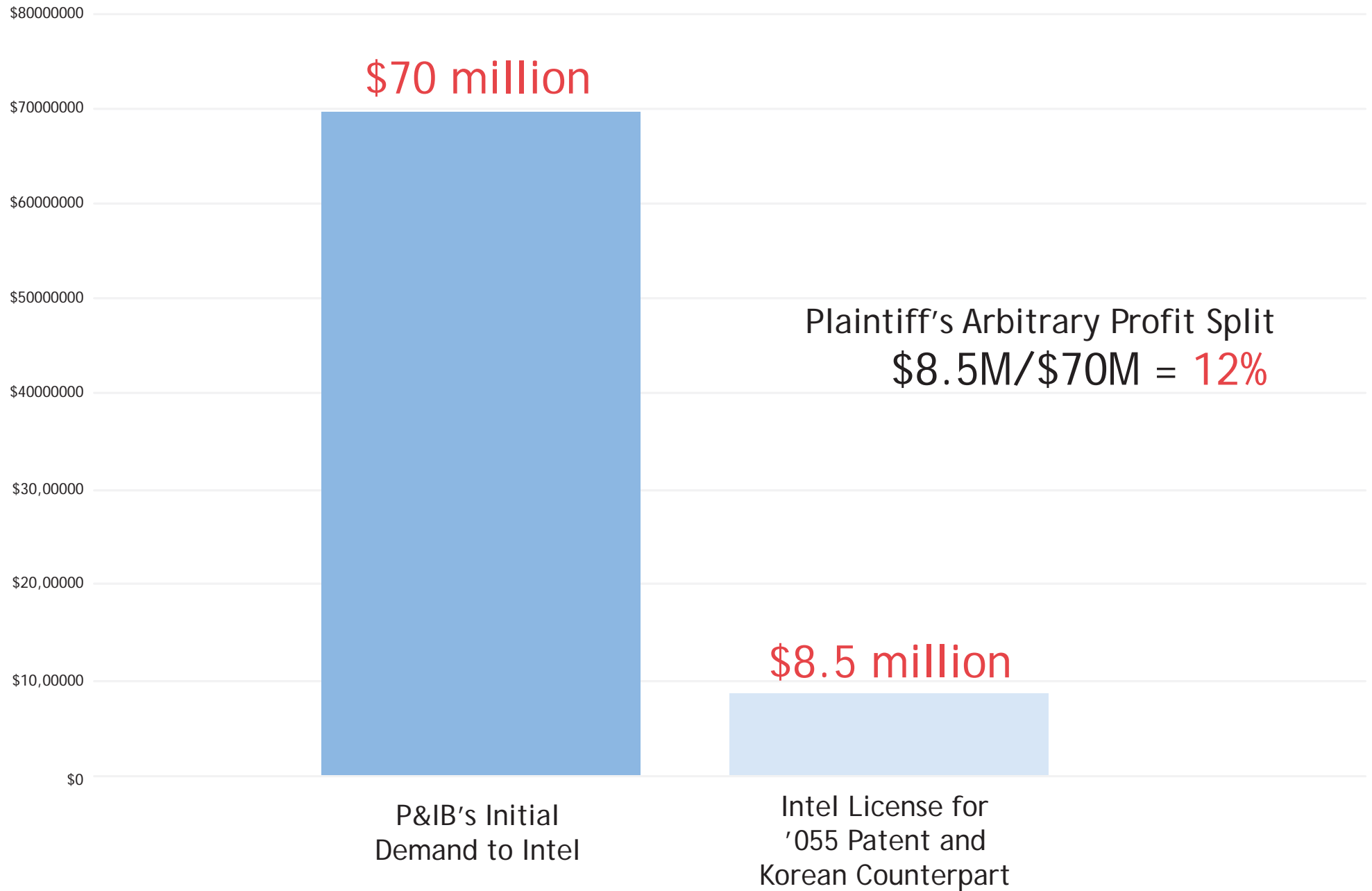
Speed and Power Efficiency Damages - Summary		
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Total Damages		\$219,936,743

Supplemental Report, Exhibits 20.1S, 20.2S, 20.3S, 20.4S, and 20.5S. PDX6.49

Ground 5:

Plaintiff arbitrarily assumed a 12% profit share

Plaintiff Arbitrarily Assumed A 12% Profit Share



Plaintiff Arbitrarily Assumed A 12% Profit Share

Weinstein's testimony is based only on the fact that, in the Intel negotiation, P&IB accepted 12% of its initial demand.

- But no evidence P&IB's initial demand of \$70M represents Intel's profit
- And no evidence \$8.5 million license represents the share of that profit that the parties decided would go to P&IB

The 12% Assumption Was Critical To Plaintiff's Damages Proposal

Speed and Power Efficiency Damages Rates - Smartphones

November 29, 2016 – May 14, 2018

1. Incremental Speed Profit Per Unit	\$21.22 per unit
2. Share to P&IB	12%
3. Speed Damages Rate (Line 1 x Line 2)	\$2.55 per unit
4. Incremental Power Efficiency Profit Per Unit	\$18.23 per unit
5. Share to P&IB	12%
6. Power Efficiency Damages Rate (Line 4 x Line 5)	\$2.19 per unit

Opening Report, p. 98 and 100, paragraphs 169 and 175.
Supplemental Report, Exhibits 11.2S, 20.2S, and 20.3S, footnote 1.

PDX6.47

Combined Speed and Power Efficiency Damages Rate - Smartphones

November 29, 2016 – May 14, 2018

1. Speed Damages Rate	\$2.55 per unit
2. Power Efficiency Damages Rate	\$2.19 per unit
3. Combined Speed and Power Efficiency Damages Rate (Line 1 + Line 2)	\$4.74 per unit

Supplemental Report, Exhibits 20.2S and 20.3S.

PDX6.48

The 12% Assumption Was Critical To Plaintiff's Damages Proposal

Cost Savings Damages - Summary



SAMSUNG




November 29, 2016 – May 14, 2018

1. Total Manufacturing Costs	\$2,537,542,706
2. Cost Savings Attributable to '055 Patent	\$845,847,568
3. Share to P&IB	<u>12%</u>
4. Total (Line 2 x Line 3)	\$101,501,708

Supplemental Report, Exhibits 16.15, 16.25, 20.05 and 20.75.

PDX68.50

The 12% Assumption Was Critical To Plaintiff's Damages Proposal

Damages Due Because Of Infringement		
	Defendants Keep 88%:	Plaintiff Receives 12%:
	\$2,384,641,900	\$321,438,451
	\$2,173,719,843	\$296,851,609
	\$722,639,459	\$98,541,744

PDX 7.71

Remedy on Damages:

JMOL of \$6.2 million or a new trial

The Proper Remedy For Plaintiff's Failure Of Proof On Damages Is JMOL For \$6.2 Million

The *only* evidence of a lump-sum award is Samsung's evidence that such an award here would be \$6.2 million.

The *only* evidence that takes into account the Intel license is likewise Samsung's evidence.

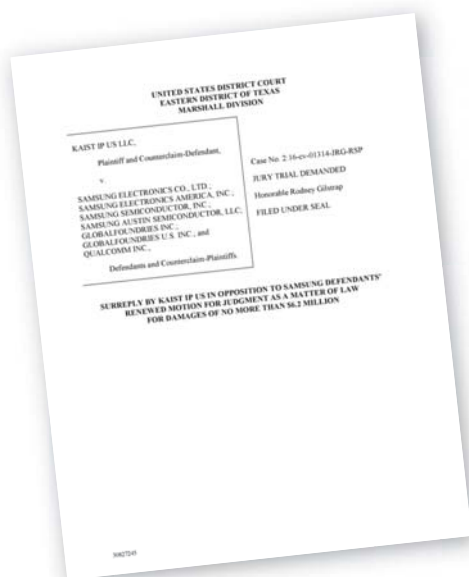
Plaintiff did *not* request a new trial in the event that this Court finds the evidence insufficient to support the damages award.

- Any such request now is therefore waived. *See Promega Corp. v. Life Techs. Corp.*, 874 F.3d 651, 661-62 (Fed. Cir. 2017).

The Proper Remedy For Plaintiff's Failure Of Proof On Damages Is JMOL For \$6.2 Million

Plaintiff

"[I]f Defendants are correct, the lower amount in the record is a *running royalty* with past damages solely for the period from November 29, 2016 to May 14, 2018 for Samsung at a 'minimum' of \$321,438,451."



Response

Wrong:

The jury found that the hypothetical license would be in the form of a lump sum.

Plaintiff did not challenge that jury finding as unsupported by the record, and it is, therefore, binding.

Thus, Plaintiff's only proposed alternative to the jury's award is unavailable as a matter of law.

Alternative Remedy on Damages:

A new trial

\$400 Million Verdict Is Against The Great Weight Of The Evidence

All of the grounds supporting JMOL also support a new trial:

1. Running royalty evidence cannot support the jury's lump sum damages award.
2. Plaintiff failed to account for the highly comparable Intel license.
3. Damages were not tied to the incremental value of the patent.
4. Damages were not tied to the smallest saleable unit.
5. Plaintiff arbitrarily assumed 12% of the patent's supposed profits would go to P&IB in the hypothetical negotiation.
6. Plaintiff's damages model improperly relied on perfect future knowledge of sales and profits in the hypothetical negotiation.
7. Plaintiff's analysis rested on an unreliable regression model.
8. Plaintiff engaged in double-counting of damages for products with Snapdragon chips.

There Is *No Evidence* Of Any Kind To Support Damages Of Greater Than \$321 Million

- Weinstein conceded that \$321 million was adequate to compensate for the infringement.
- Plaintiff never produced any evidence for a greater damages amount for Samsung.

The Verdict Reflects Passion And Prejudice

- The jury awarded more than Plaintiff requested.
- The jury awarded damages only against only Samsung, not other Defendants, even though they were found to infringe.
- Plaintiff improperly villainized Samsung.

The Verdict Reflects Passion And Prejudice

Plaintiff's improper comments in closing:

3 So I told you guys that I spent my whole life in
4 California. And there's this great basketball player in
5 California named Steph Curry. And when Steph Curry first
6 joined the NBA, he was really thin, and people didn't think
7 he was actually going to be that good of a player. His
8 rookie contract with Golden State was incredibly low. Golden
9 State got this incredible deal, but his next contract, when
10 people knew how amazing he was, was incredibly large.

11 Intel, the American company, who did the -- who
12 followed the law -- Intel, the American company --

13 THE COURT: One minute left.

14 MR. SHEASBY: -- who took a license to this patent
15 voluntarily, got an incredible deal. No one disputes that.
16 These multi-national companies that are the biggest in the
17 world, they don't get a rookie deal. Rookie deals were in
18 2011. Today, they get what is due.

Issues To Resolve In The Event Of A Damages Retrial

If there is a damages retrial, the jury's finding that the award would be a lump sum must be respected as a matter of law and cannot be retried.

- “[N]o fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of common law.” U.S. Const. amend. VII.

Samsung respectfully requests that this Court address all of the noted deficiencies in the damages analysis even though any one of them is sufficient for JMOL or a new trial.

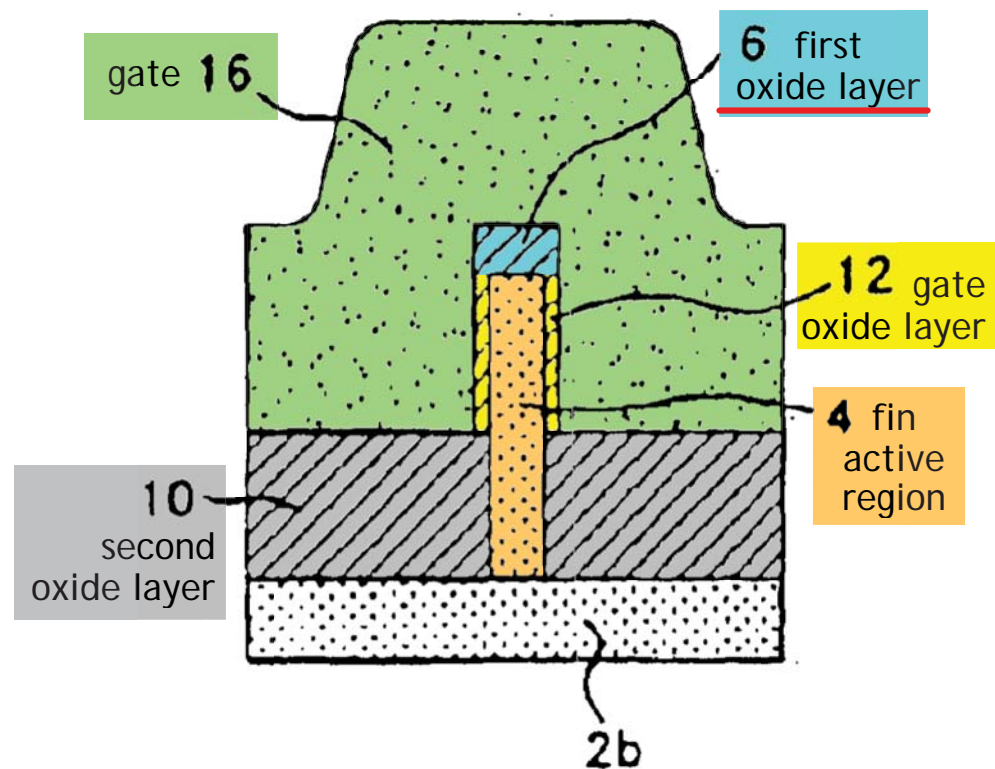
New Trial on Liability For Improper Exclusion of Evidence Ground 1:

Exclusion of Dr. Subramanian's testimony that the SiO₂ layer and HfO layer are not a single "layer"

'055 Patent: The Claims Require A "first oxide layer"

'055 PATENT, CLAIM 1

1. A double-gate FinFET device, comprising:
 - a bulk silicon substrate;
 - a Fin active region which is a wall-shape single crystalline silicon on a surface of the bulk silicon substrate and connected to said bulk silicon substrate;
 - a second oxide layer which is formed up to a certain height of the Fin active region from the surface of bulk silicon substrate;
 - a gate oxide layer which is formed on both side-walls of the Fin active region protruded from said second oxide layer;
 - a first oxide layer which is formed on the upper surface of said Fin active region with a thickness greater or equal to that of the gate oxide;
 - a gate which is formed on said first and second oxide layer;
 - a source/drain region which is formed on both sides of the Fin active region except where said gate overlaps with the Fin active region; and
 - a contact region and a metal layer which are formed at said source/drain and gate contact region,
- wherein the thickness of said gate oxide layer is between 0.5 nm and 10 nm, and the thickness of said first oxidation layer is between 0.5 nm and 200 nm.



Magistrate Judge Payne Found Dr. Subramanian's Opinion Created A Fact Issue As To Whether The SiO₂ And HfO Layers Are a Single Layer

Defendants present evidence that the accused devices have a silicon dioxide layer (SiO₂) formed around the entire surface of the fin. Subramanian Rep. [Dkt. # 228-10] ¶ 110. “Well after” formation of that SiO₂ layer, a different process forms a hafnium dioxide (HfO) layer over the SiO₂ layer. *Id.* ¶ 111. The gate electrode is then formed on the HfO layer. *Id.* ¶ 121. *See* GF_KAISTIP00000239 *supra*.

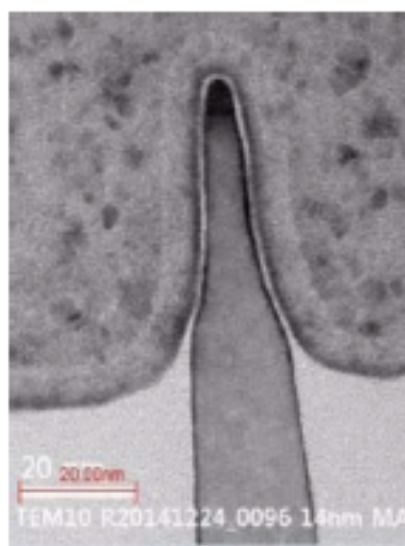
Plaintiff contends the SiO₂ and HfO layers together compose a broader layer formed completely around the fin. Pl.’s Mot. [Dkt. # 228] at 14. The SiO₂ part of this broader layer

...

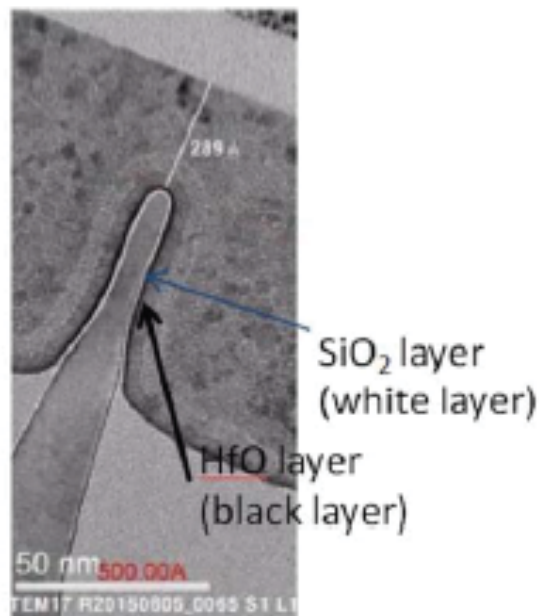
This presents a fact issue for the jury to resolve—whether the SiO₂ and HfO layers are a single layer formed on the sidewalls and upper surface of the fin active region. The answer to *that* question, in turn, relates to whether the gate is formed on the “first oxide layer” as recited by the claims. Thus, because Defendants have presented evidence from which a jury might return a verdict in their favor, Plaintiff’s Motion for Summary Judgment of Infringement [Dkt. # 228] should be **DENIED**.

Dr. Subramanian Opined In His Report That The SiO₂ And HfO Layers Are Different Layers And Not The Claimed “first oxide layer”

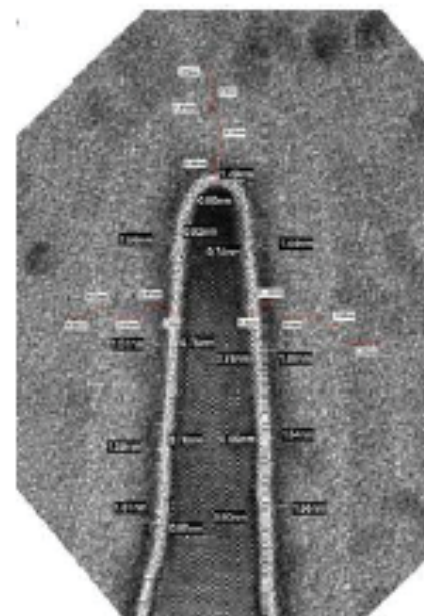
117. The Accused Logic Devices have one gate oxide which wraps around the surface of the parabolically-shaped semiconductor fin underneath the gate electrode. This oxide comprises two layers—an interfacial SiO₂ layer (“IL”) and a high-k dielectric layer (“HK”). These layers are shown in the below TEMs.



Samsung 14 nm LPE



Samsung 14 nm LPP



Globalfoundries

Dr. Subramanian Opined In His Report That The SiO₂ And HfO Layers Are Different Layers And Not The Claimed “first oxide layer”

112. There is no difference between the interfacial SiO₂'s composition and structure on the vertex (or fin) of this parabolically-shaped fin and its composition and structure at points further down from the vertex of the fin. The interfacial SiO₂ is formed at all locations on the surface of the parabolically-shaped fin at the same time using the same process. The interfacial SiO₂ layer cannot correspond to the claimed “first oxide layer” because the gate electrode is not formed on the interfacial SiO₂ as required by the claims. See '055 Patent at independent claims 1, 7, and 13 (“a gate which is formed on said first and second oxide layer”).

113. There is no difference between the HfO's composition and structure on the interfacial SiO₂ on the vertex (or tip) of this parabolically-shaped fin and its composition and structure at points further down from the vertex of the fin. The HfO is formed at all locations on the interfacial SiO₂ at the same time using the same process. The HfO layer is not formed on the surface of the semiconductor fin. Instead, the HfO layer is formed on the surface of the interfacial SiO₂ layer. As such, the HfO layer cannot correspond to the claimed “first oxide layer” which is required to be “formed on the upper surface of said Fin active region” '055 Patent at independent claims 1, 7, and 13.

interfacial

ADJECTIVE

- 1 Included between two faces of a crystal or other solid.

+ Example sentences

- 2 Relating to or forming a common boundary between two portions of matter or space.

+ Example sentences

Oxford Dictionary definition of “interfacial”

Plaintiff Erroneously Represented That Dr. Subramanian's "Two Different Layers" Testimony Went Beyond His Report

Dr. Subramanian: The Hafnium oxide layer is formed by a dif - it's a separate layer formed by a different technique at a different time in a different tool. And that layer I show in black, and you'll notice something important out of it.

Mr. Sheasby: Your Honor, now it's clearly outside the scope of the report. I reurge my objection.

Mr. Soobert: Your Honor, he's talking about the Hafnium oxide layer. It's in his report.

The Court: Approach the bench, counsel.
(Bench conference.)

The Court Precluded Dr. Subramanian's "Two Different Layers" Testimony

The Court: It's clear from what happened in our discussion in chambers that the Hafnium oxide layer and the silicon dioxide layer together form a single layer. And he's not going to say that both of them together are not a single oxide layer.

* * * *

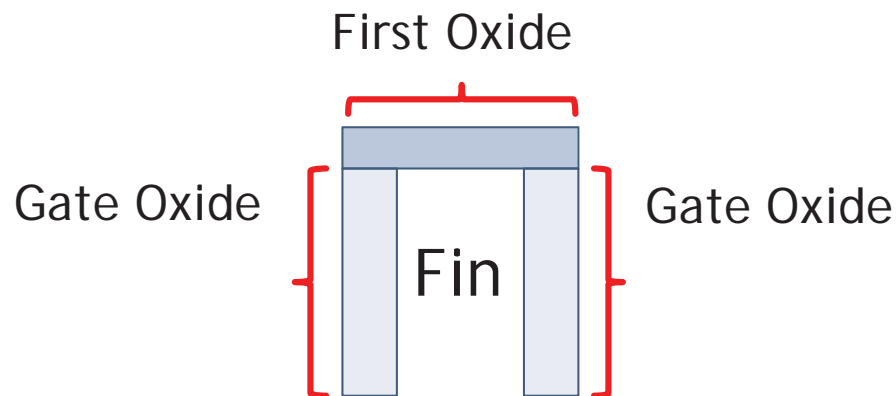
Dr. Subramanian: So not only is the Hafnium oxide over the blue, it's also over the gray. So you can see that the requirements, therefore, cannot be met by the Hafnium oxide layer, because the Hafnium oxide layer breaks up that sequence. You never have orange, blue, green, or gray, green. Hafnium oxide cannot meet the requirements, and as I pointed out earlier, neither can silicon dioxide."

Mr. Sheasby: Your Honor, I move to strike that last answers.

The Court: I'm going to sustain that objection. And I do believe the witness has exceeded the scope of his report with that last statement.

Magistrate Judge Payne Did Not Preclude Dr. Subramanian's "Two Different Layers" Testimony

'055 Patent:



Judge Payne excluded:

The continuous oxide around the Fin means that there is no distinction between the first oxide and gate oxide, as required by the claims.

The Court excluded at trial:

The HfO and SiO₂ are different layers, and neither satisfies the first oxide layer requirement of the claims.

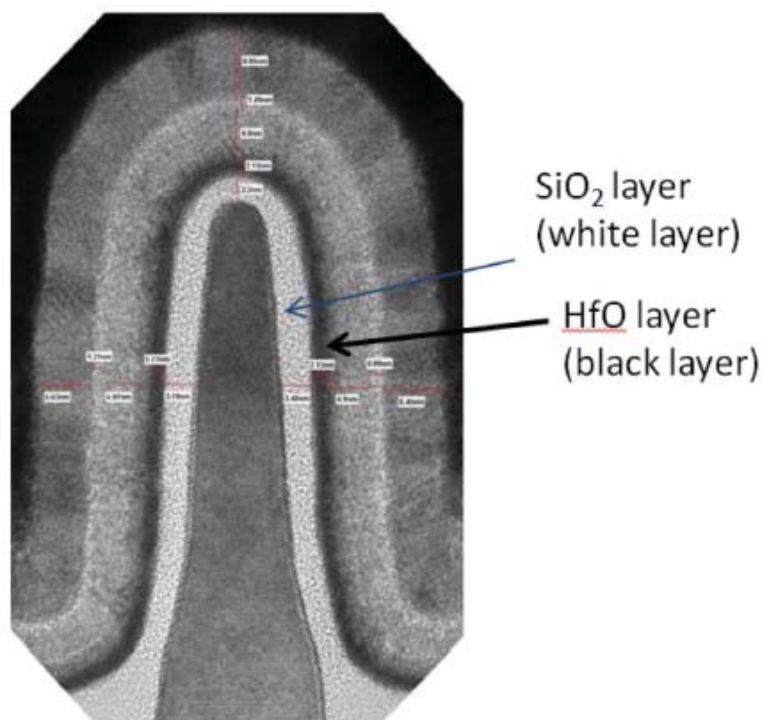
Dr. Subramanian Opined That There Is One Gate Oxide

100. All claims of the '055 Patent require both “a gate oxide layer which is formed on both side-walls of the Fin active region” and “a first oxide layer which is formed on the upper surface of said Fin active region.” *See* '055 Patent at independent claims 1, 7 and 13.

101. The Accused Devices do not satisfy this claim requirement because the Accused Devices do not have both of these required oxide layers. Instead, the Accused Devices have one gate oxide which wraps around the surface of a parabolically-shaped semiconductor fin underneath the gate electrode.

Dr. Subramanian Opined In His Report That the Accused Products Have A Gate Oxide Comprised Of Two Distinct Layers

102. This gate oxide, which wraps around the surface of a parabolically-shaped fin, comprises two layers—an interfacial SiO₂ layer and an HfO high-k dielectric layer. As described in more detail below, the interfacial SiO₂ layer is first formed around the surface of the exposed fin. Then, at a later time, the HfO high-k dielectric layer is formed on the surface of the interfacial SiO₂ layer.

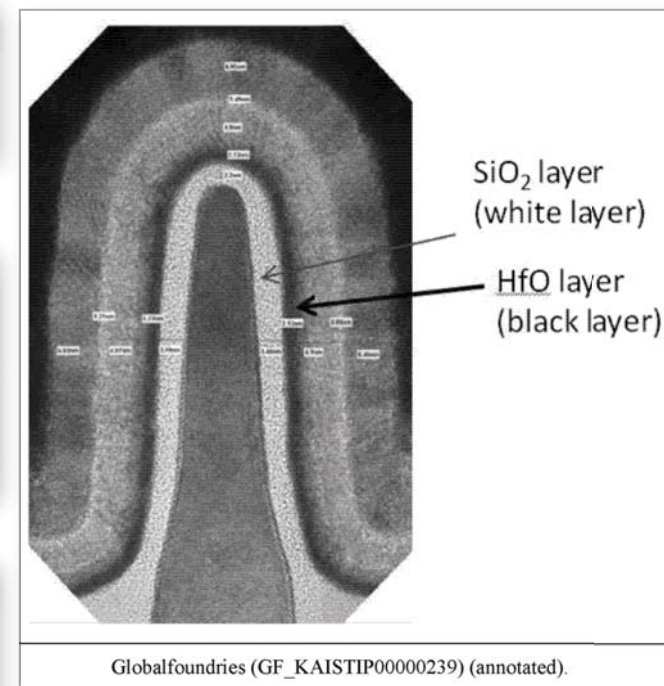


But Dr. Subramanian Opined That The SiO₂ And HfO Layers Were Two Separate Layers

109. As mentioned above, the gate oxide in the Accused I/O Devices comprises two layers—an interfacial SiO₂ layer and an HfO high-k dielectric layer.

117. The Accused Logic Devices have one gate oxide which wraps around the surface of the parabolically-shaped semiconductor fin underneath the gate electrode. This oxide comprises two layers—an interfacial SiO₂ layer (“IL”) and a high-k dielectric layer (“HK”).

118. As mentioned above, the gate oxide in the Accused Logic Device comprises two layers—an interfacial SiO₂ layer and an HfO high-k dielectric layer.



New Trial For Improper Exclusion of Evidence Ground 2:

Exclusion of Dr. Subramanian's testimony that the SiO_2 layer and HfO layer could not be both the "first oxide layer" and "gate oxide layer"

'055 Patent: The Plain Language Of The Claim Requires A "gate oxide layer" And A "first oxide layer"

1. A double-gate FinFET device, comprising:
a bulk silicon substrate;
a Fin active region which is a wall-shape single crystalline silicon on a surface of the bulk silicon substrate and connected to said bulk silicon substrate;
a second oxide layer which is formed up to a certain height of the Fin active region from the surface of bulk silicon substrate;
a gate oxide layer which is formed on both side-walls of the Fin active region protruded from said second oxide layer;
a first oxide layer which is formed on the upper surface of said Fin active region with a thickness greater or equal to that of the gate oxide;
a gate which is formed on said first and second oxide layer;
a source/drain region which is formed on both sides of the Fin active region except where said gate overlaps with the Fin active region; and
a contact region and a metal layer which are formed at said source/drain and gate contact region,
wherein the thickness of said gate oxide layer is between 0.5 nm and 10 nm, and the thickness of said first oxidation layer is between 0.5 nm and 200 nm.

- Neither term was construed during claim construction.

Dr. Subramanian Opined That No “layer” In The Accused Products Could Be Both The “gate oxide layer” And “first oxide layer”

(“a gate which is formed on said first and second oxide layer”). In addition, to the extent one would argue that the interfacial SiO₂ layer corresponds to the claimed “gate oxide layer,” the interfacial SiO₂ layer cannot also correspond to the claimed “first oxide layer” for an additional reason. Specifically, the Plaintiff cannot point to the same layer as corresponding to both features of the claimed structure.

. . . .

See '055 Patent at independent claims 1, 7, and 13. In addition, the Plaintiff cannot point to the HfO layer as corresponding to both “gate oxide layer” and “first oxide layer” features of the claimed structure.

Dr. Subramanian Should Have Been Allowed To Present To The Jury His Opinion Based On The Plain Language



"The district court did not err in concluding that these terms have plain meanings that do not require additional construction. ...

It was up to the jury to determine from the evidence presented at trial whether the ActiveVideo system satisfied the plain and ordinary meaning of the 'superimposing' limitations."

ActiveVideo Networks, Inc. v. Verizon Communications, Inc., 694 F.3d 1312 (Fed. Cir. 2012)

But The Magistrate Judge's Ruling Erroneously Treated The Issue As One Of Claim Construction Rather Than Infringement

The '055 Patent's specification makes this a straight-forward issue. The patent shows an embodiment of the invention with a continuous layer of material in contact with the fin active region (4). '055 Patent fig.3a, 3b. The specification identifies part of that continuous layer as the gate oxide layer (12) formed on the sidewalls of the fin, a second part as the first oxide layer (6) formed on the fin's upper surface, and a third part as the second oxide layer (10) formed on the underlying bulk substrate (2b). *Id.* at 5:35–52. Contrary to Defendants' contention, this describes the first oxide layer and gate oxide layer as different regions of one continuous layer that surrounds the fin active region. Thus, Subramanian's statement that "the Plaintiff cannot point to the same layer as corresponding to both features of the claimed structure" is an incorrect construction of the claim, and the Court will **preclude** Defendants and Subramanian from advancing that position before the jury.

